

Theoretical Physics Seminar

Disparity of Larmor's formula with energy-momentum conservation

Speaker: Dr. Ashok Kumar Singal (PRL)

From: Physical Research Laboratory, Ahmedabad

When: 9th November 2017, 4:00 pm

Place: Room No. 469

The well-known Larmor's formula, which yields power losses of a radiating charge proportional to the square of its acceleration, is not compatible with energy-momentum conservation. In fact, the radiative loss picture derived from Larmor's formula is not consistent with the special theory of relativity.

One needs to clearly distinguish between the rate of energy-momentum being carried away by the electromagnetic radiation and that of mechanical energy-momentum losses being incurred by the radiating charge. In literature both power rates are treated as not only equal but almost synonymous.

This 100-year old oversight is due to a mathematical subtlety that has been missed in the applicability of Poynting's theorem.

All are welcome